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SAFETY INSTRUCTIONS

GENERAL GUIDELINES

1. It is advised to insert an isolation transformer in the AC supply before servicing a hot chassis.

2. Potentials as high as 33KV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by any one who is not competent with the precautions necessary when working on the high voltage equipment. Always discharge the anode of the tube.

3. When servicing observe the original lead dress in the high voltage circuits. If a short circuit is found, replace all the parts which have been overheated or damaged by the short circuit.

4. Always use the manufacturer's replacement safety components. The critical safety components marked with ⚠ on the schematics diagrams should not be replaced by other substitutes. Other substitute may create the electrical shock, fire or other hazards. Take attention to replace the spacers with the originals. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.

5. After servicing, see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.

6. When the receiver is not being used for a long time of period of time, unplug the power cord from the AC outlet.

7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazard.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs of the plug.

2. Turn the receiver's power switch on.

3. Measure the resistance value with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, aerials, connectors, control shafts etc. When the exposed metallic part a return path to the chassis the reading should be between 4Mohm and the 20Mohm. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

LEAKAGE CURRENT HOT CHECK

1. Plug the AC cord directly in to the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 2Kohm 10W resistor in series with an exposed metallic part on the receiver and an earth, such as a water pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.
4. Check each exposed metallic part and check the voltage at the each point.
5. Reverse the AC plug at the outlet and repeat each of the above measurements.
6. The potential at the any point should not exceed 1.4 Vrms. In case a measurement is outside the limits specified, there is the possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.

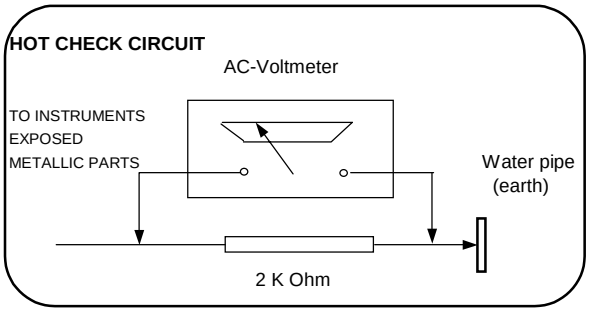


Figure 1

X-RAY RADIATION WARNING

The primary source of X-ray radiation in this receiver is the picture tube. The chassis is specially constructed to limit X-ray radiation. For continued X-ray radiation protection, replace the tube with the same type of the original one.

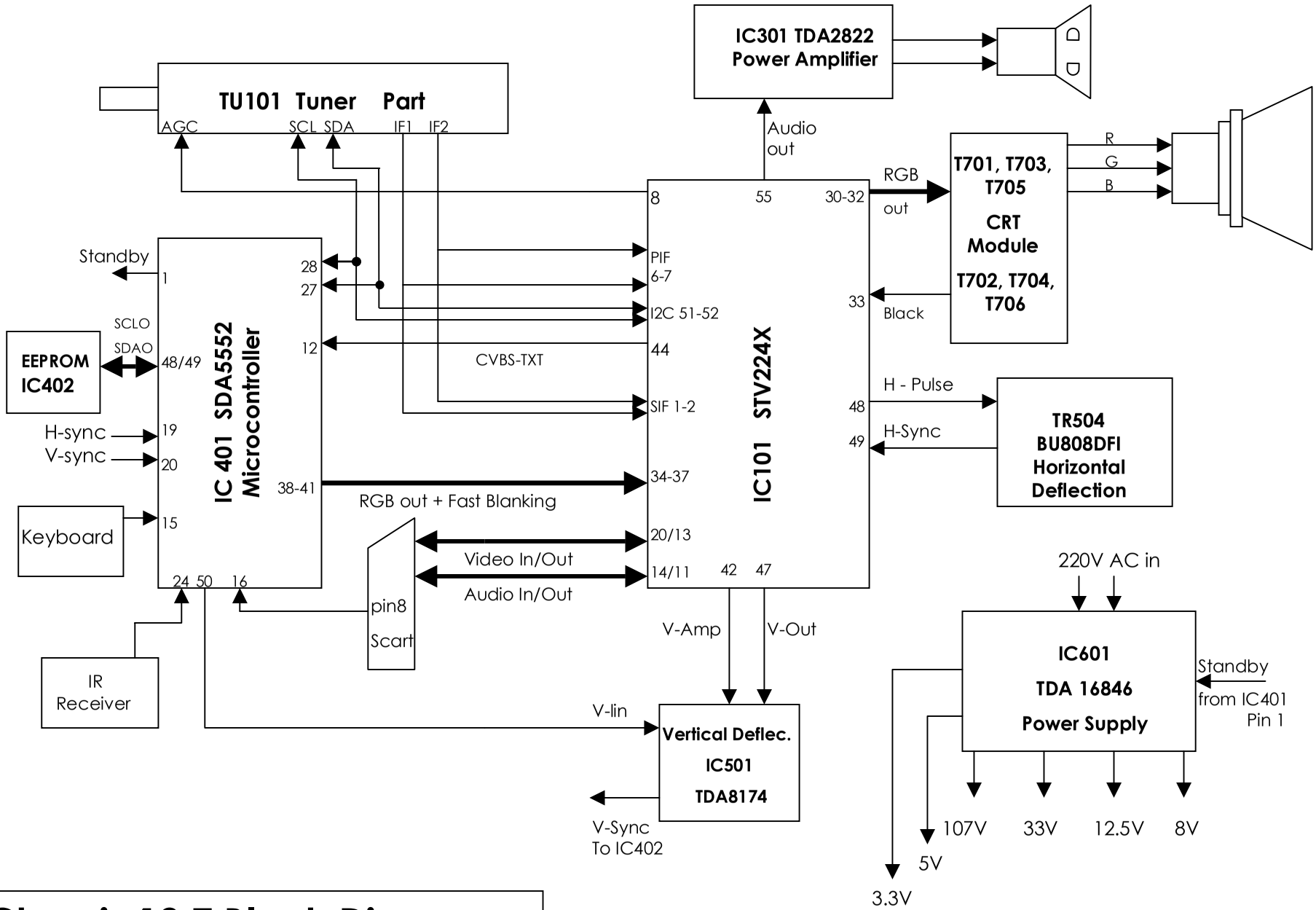
CAUTION

AFTER REMOVAL OF THE ANODE CAP, DISCHARGE THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT WITH A HIGH VOLTAGE PROBE AND MULTIMETER (SELECT VDC) AND THEN SHORT CIRCUIT DIRECTLY TO DISCHARGE COMPLETELY.

TECHNICAL SPECIFICATIONS

Power source:	220-240V AC, 50-60Hz	
Power consumption (max.) :	70 W	14”
	85 W	20”, 21”
Standby power consumption :	5 W	
Aerial impedance :	75Ohm, coaxial type	
Receiving system [1]:	PAL BG	
	PAL SECAM BG	
	PAL SECAM BG DK	
	PAL I	
Receiving channels:	VHF BAND I	CH2-4
	VHF BAND III	CH5-12
	CABLE TV	S1-41
	UHF BAND	CH21-69
Audio outputs :	2.0W RMS at %10 THD	14”
	2.5W RMS at %10 THD	20”, 21”
High Voltage :	23 ± 0.5 KV	14”
	25 ± 0.5 KV	20”, 21”
Focus voltage :	%25.6 ± %38 of EHT	
Grid 2 voltage :	0-1400 V	
Heater voltage :	6.2 ± 0.2 Vrms	
Video/Audio Terminals :	AV1 IN	Video : 1 Vpp,75 Ohm Audio : 0.5 Vrms, >10 Kohm RGB
	AV1OUT	Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, <1 Kohm
	AV2 IN (RCA, optional)	Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, >10 Kohm
Operating temperature :	0-45 Degrees	
Safety :	IEC 65 /BS P2N	
X-Ray radiation :	ACC. IEC 65/BS P2N	

[1] : TV set is produced to receive “one” of these colour and sound systems.



Chassis 12.7 Block Diagram

PIN VOLTAGES OF IC'S

IC101 (STV2246) BUS CONTROLLED MULTISTANDARD ONE CHIP TV PROCESSOR					
Pin	**Connection**	**V DC (*)**	**Pin**	**Connection**	**V DC (*)**
1	Sound IF Input 1	0.96	**29**	Not connected	3.20
2	Sound IF Input 2	0.96	**30**	Blue Output	2.30
3	AGC SIF Capacitor (not connected)	0.22	**31**	Green Output	2.34
4	IF Voltage Reference Filtering	3.15	**32**	Red Output	2.48
5	AGC Picture IF Capacitor	2.42	**33**	Cathode Current Measurement Input	4.17
6	Picture IF Input 1	2.47	**34**	OSD Blue Input	4.22
7	Picture IF Input 2	2.47	**35**	OSD Green Input	4.35
8	AGC Tuner Output	2.54	**36**	OSD Red Input	4.21
9	IF PLL Filter	2.03	**37**	OSD Fast Blanking	0.31
10	IF Ground	0.00	**38**	Cloche Filter Tuning Capacitor	0.11
11	AM/FM Mono Sound Output	3.78	**39**	3.5X MHz Crystal	0.35
12	5 V IF Supply	4.97	**40**	4.43 MHz Crystal	-
13	Internal CVBS Output	3.00	**41**	Chroma PLL Filter	-
14	External Audio Input	2.42	**42**	Vertical Amplitude DAC Output	4.03
15	LC Input 1	3.90	**43**	Chroma/Scanning Ground	0.00
16	LC Input 2	3.90	**44**	Second Video Switch Output	4.09
17	Video/Luma Supply Voltage (8 V)	8.05	**45**	Chroma/Scanning Power Supply (8V)	8.06
18	Internal Video Input	3.63	**46**	Beam Current Limiter Control Voltage and Safety Input (XRAY)	6.54
19	Video/Luma Ground	0.00	**47**	Vertical Output Pulse	5.62
20	External Video Input	3.22	**48**	Horizontal Output Pulse	1.39
21	Black Stretch Capacitor	2.74	**49**	Line Flyback Input and Super-sandcastle Output	0.72
22	Y/CVBSIN3 Y(SVHS) or CVBS3 External Input	3.22	**50**	Scanning PLL Filter	3.98
23	Chroma (SVHS) Input	1.70	**51**	SCL I2C Bus Clock Input	3.10
24	Automatic RGB Peak Regulation	4.45	**52**	SDA I2C Bus Data Input	2.80
25	External Blue Input	2.52	**53**	Digital Supply Voltage (5 V)	5.00
26	External Green Input	1.73	**54**	Digital Ground	0.00
27	External Red Input	2.52	**55**	Main Audio Output	3.91
28	External Fast Blanking Input	0.00	**56**	FM Demodulation Capacitor	1.71

IC301 (TDA2822) Audio Output IC					
Pin	**Connection**	**V DC**	**Pin**	**Connection**	**V DC**
1	Input A +	-	**9**	Not connected	0.00
2	Not connected	0.00	**10**	Not connected	0.00
3	Input A -	0.52	**11**	Output B	5.99
4	Ground	0.00	**12**	Ground	0.00
5	Ground	0.00	**13**	Ground	0.00
6	Output A	5.96	**14**	Input B-	0.52
7	Not connected	0.00	**15**	Not connected	0.00
8	VCC	12.9 (13.5)	**16**	Input B -	0.00

IC401 (SDA5552) MICRO CONTROLLER WITH OSD AND TELETEXT					
Pin	**Connection**	**V DC (*)**	**Pin**	**Connection**	**V DC (*)**
1	Standby	0.06 (2.09)	**27**	SDA I2C Bus Data Input	1.7 (1.93)
2	Not connected	0.80	**28**	SCL I2C Bus Clock Input	1.7 (1.93)
3	Mute	0.06 (1.62)	**29**	Ground	0.00
4	LED	1.48 (0.07)	**30**	VDD 3.3 supply pin	3.30
5	Not connected	0.8 (0.9)	**31**	Not connected	0.00
6	Not connected	0.8 (0.9)	**32**	Not connected	3.30
7	Not connected	0.8 (0.9)	**33**	Reset	3.30
8	Not connected	0.8 (0.9)	**34**	XTAL2	-
9	VDD 2.5 supply pin	2.46 (2.54)	**35**	XTAL1	-
10	Ground	0.00	**36**	Ground	0.00
11	VDD 3.3 supply pin	3.30	**37**	VDDA 2.5 supply pin	2.41 (2.68)
12	CVBS input for TXT	0.88 (0.99)	**38**	Red output for OSD and TXT	0.28 (0.0)
13	VDDA 2.5 supply pin	2.41 (2.68)	**39**	Green output for OSD and TXT	0.28 (0.0)
14	Ground	0.00	**40**	Blue output for OSD and TXT	0.28 (0.0)
15	Local keyboard input	2.50	**41**	Fast Blanking for OSD and TXT	0.00
16	Status signal input of Scart pin 8	0.00	**42**	VDD 2.5 supply pin	2.54
17	Not connected	0.7 (0.8)	**43**	Ground	0.00
18	Power Ctrl	1.46 (0.24)	**44**	VDD 3.3 supply pin	3.30
19	Horizontal sync input	2.00 (2.42)	**45**	Not connected	3.30
20	Vertical sync input	3.13 (3.30)	**46**	Not connected	0.00
21	Not connected	3.27	**47**	Not connected	3.28
22	Not connected	3.27	**48**	SDA I2C Bus for Eeprom	3.28
23	Not connected	3.27	**49**	SCL I2C Bus Clock for Eeprom	3.28
24	Infra red input	3.27	**50**	Vertical linearity	0.68
25	AV selection	0.00	**51**	Not connected	3.28
26	Service	3.27	**52**	Not connected	3.28

IC501 (TDA8174) Vertical Deflection Output IC					
Pin	**Connection**	**V DC**	**Pin**	**Connection**	**V DC**
1	Power output	12.55	**7**	Ramp generator	4.76
2	Output stage Vs	26.78	**8**	Buffer output	5.68
3	Trigger input	5.41	**9**	Inverting input	4.48
4	Height adjustment	6.78	**10**	Vs	26.17
5	Not connected	4.48	**11**	Flyback generator	1.86
6	Ground	0.00			

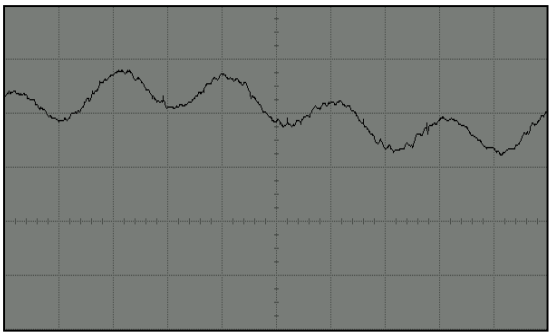
IC601 (TDA16846) Power Supply IC					
Pin	**Connection**	**V DC (*)**	**Pin**	**Connection**	**V DC (*)**
1	Off time circuit (for standby frequency)	2.91 (2.70)	**8**	Not connected	-
2	Primary Current Simulation and Startup	1.79 (1.53)	**9**	Reference Ref. Voltage (5V)	5.59 (5.57)
3	Regulation and Zero Crossing Input	2.17 (0.90)	**10**	Fault Comparator 1 (not used)	0.00
4	Soft-Start and Regulation Capacitor	3.77 (2.14)	**11**	Primary Voltage Check	2.61 (2.67)
5	Opto Coupler Input (not connected)	4.64 (4.61)	**12**	Ground	0.00
6	Fault Comparator 2 (not used)	0.00	**13**	Output	3.03 (1.06)
7	Synchronization Input (for fixed freq.)	5.59 (5.57)	**14**	Supply Voltage	13.3 (11.1)

(*) Standby measurement values are given in parenthesis

WAVEFORMS OF SOME IC AND TRANSISTOR PINS

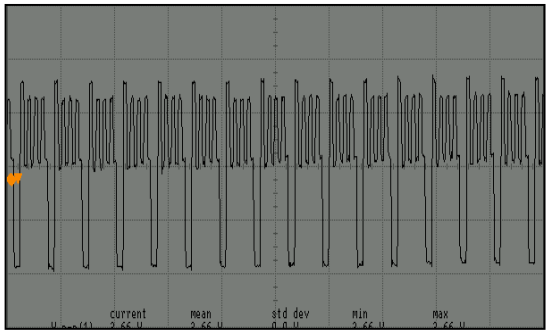
Note: TV is connected to a patern generator (Colour bar, sound 1 kHz).

IC101 (STV224X)



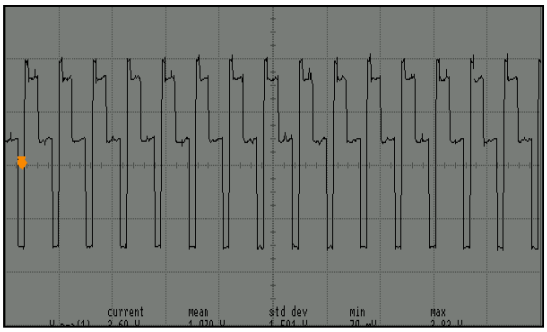
Pin 11

1V/div, 100 usn/div, Vpp=1.6 V



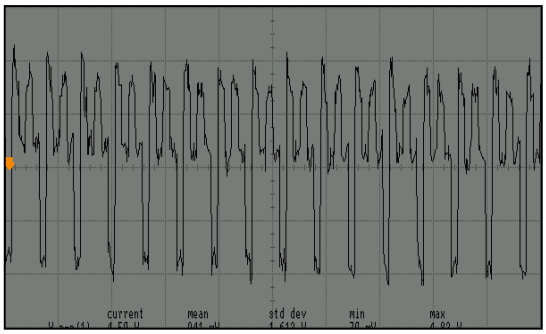
Pin 30

1V/div, 100 usn/div, Vpp=3.7 V, 15625 Hz



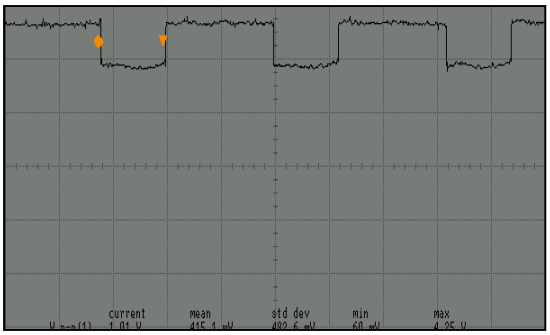
Pin 31

1V/div, 100 usn/div, Vpp=3.7 V, 15625 Hz



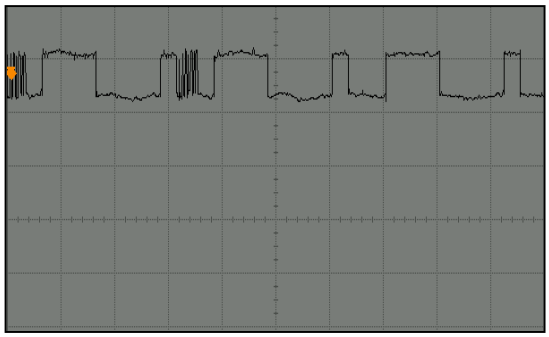
Pin 32

1V/div, 100 usn/div, Vpp=4.5 V, 15625 Hz



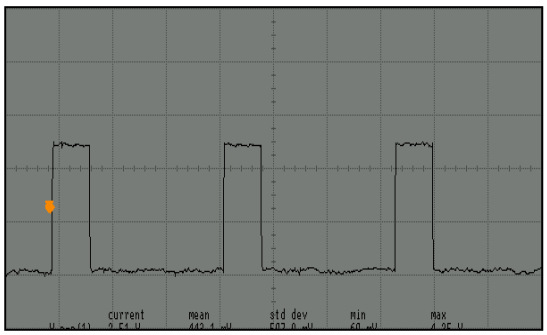
Pin 34 (OSD Off)

1V/div, 20 usn/div, Vpp=1 V, 15625 Hz



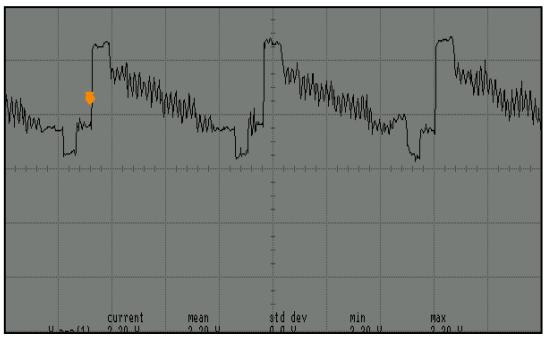
Pin 34 (OSD On)

1V/div, 20 usn/div, Vpp=1 V, 15625 Hz



Pin 37 (OSD On)

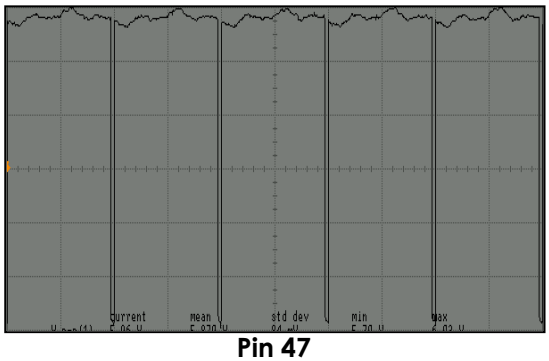
1V/div, 20 usn/div, Vpp=2.51 V, 15625 Hz



Pin 44

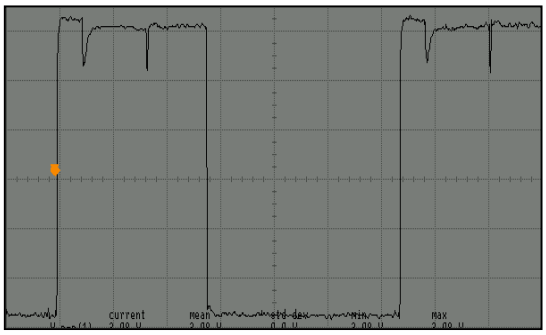
1V/div, 20 usn/div, Vpp=2.3 V, 15625 Hz

IC101 (STV224X)



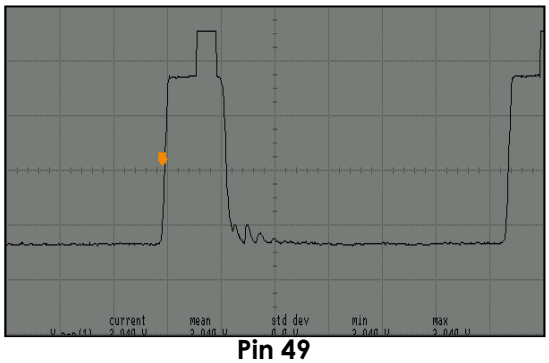
Pin 47

1V/div, 10 msn/div, Vpp=6.0 V, 50 Hz



Pin 48

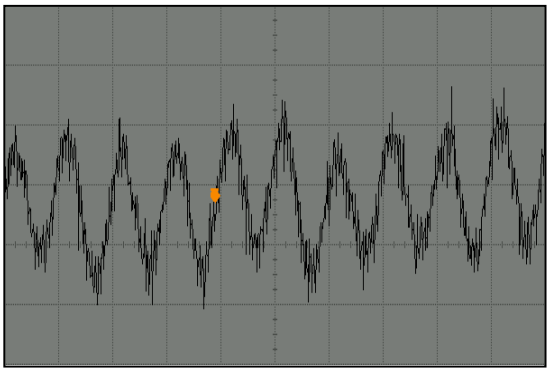
1V/div, 10 usn/div, Vpp=3.1 V, 15625 Hz



Pin 49

1V/div, 10 usn/div, Vpp=3.9 V, 15625 Hz

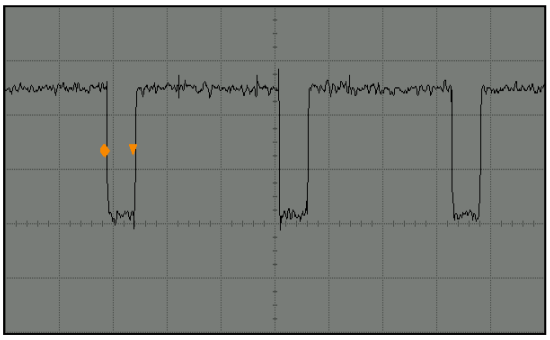
IC301 (TDA2822)



Pin 11

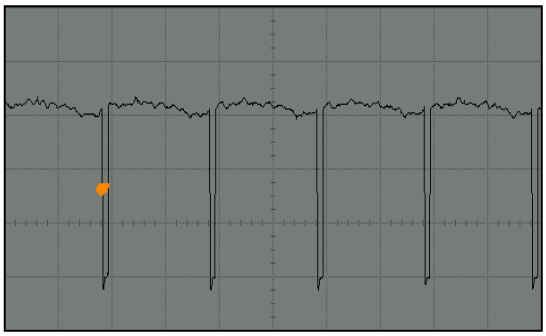
50mV/div, 1 msn/div, Vpp=180 mV

IC401 (SDA5552)



Pin 19

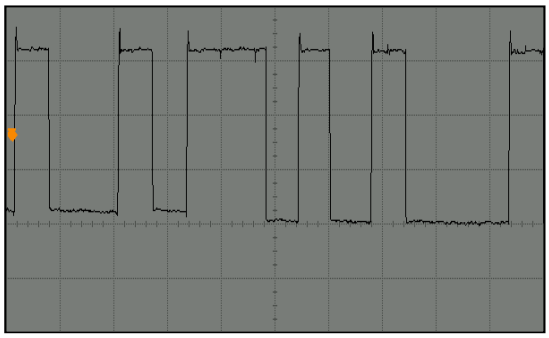
1V/div, 20 usn/div, Vpp=3 V



Pin 20

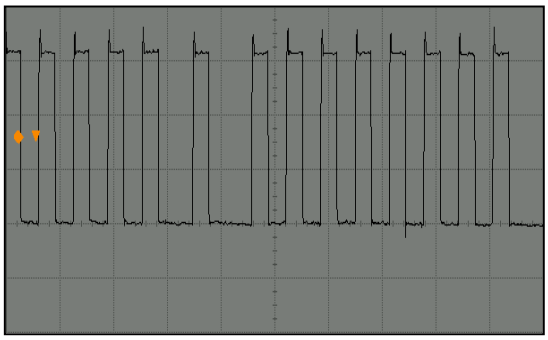
1V/div, 10 msn/div, Vpp=3.6 V, 50 Hz

IC401 (SDA5552)



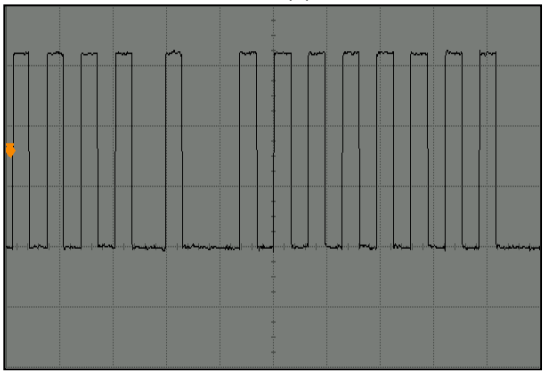
Pin 27

1V/div, 50 usn/div, Vpp=3.6 V, 10.4 kHz



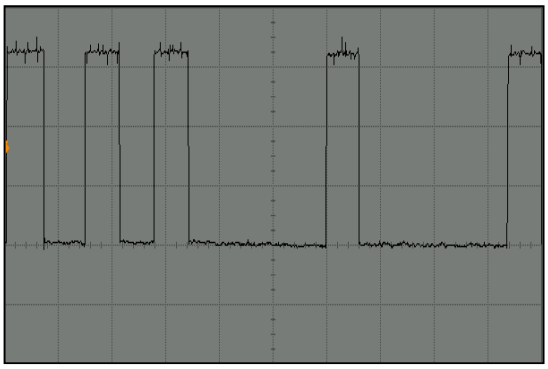
Pin 28

1V/div, 50 usn/div, Vpp=3.9 V, 31.2 kHz



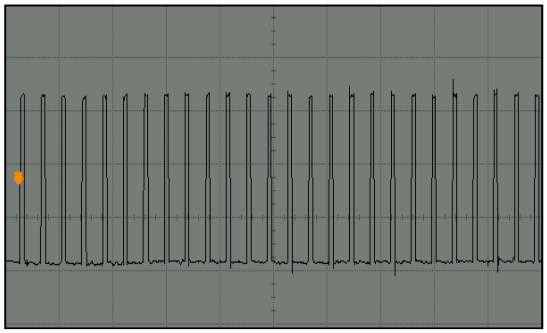
Pin 48

1V/div, 50 usn/div, Vpp=3.3 V, 31.2 kHz



Pin 49

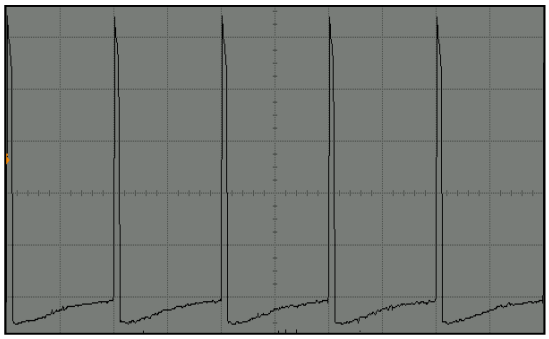
1V/div, 50 usn/div, Vpp=3.6 V, 13.7 kHz



Pin 50

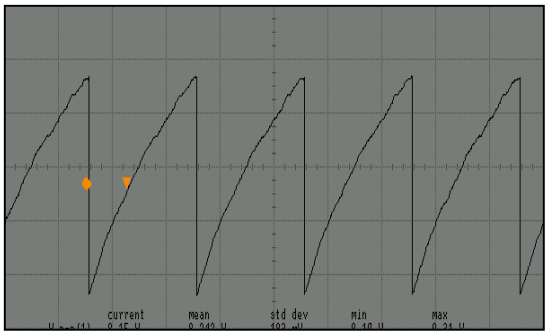
1V/div, 10 usn/div, Vpp=3.7 V, 260 kHz

IC501 (TDA8174)



Pin 2

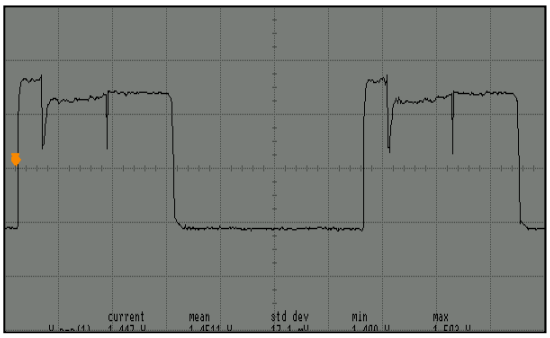
5V/div, 10 msn/div, Vpp=26.7 V, 50 Hz



Pin 7

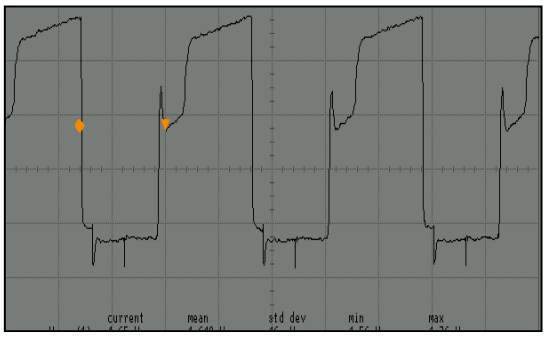
2V/div, 10 msn/div, Vpp=8.1 V, 50 Hz

T551



Base

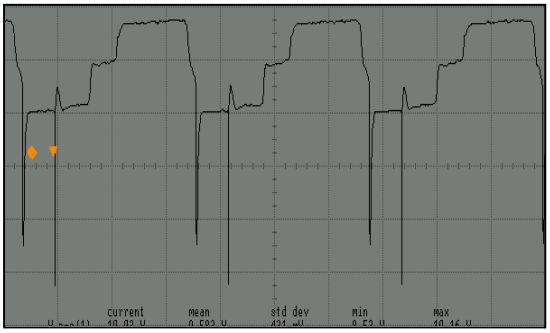
500mV/div, 10 usn/div, Vpp=1.5V, 15625 Hz



Collector

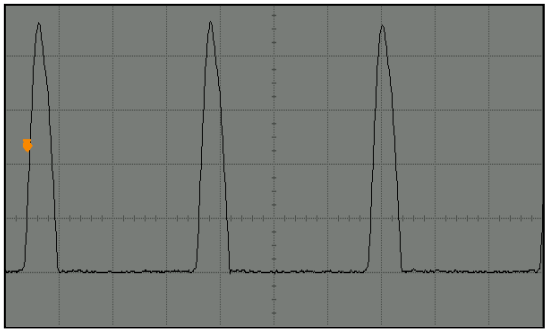
1 V/div, 20 usn/div, Vpp=4.7V, 15625 Hz

T552



Base

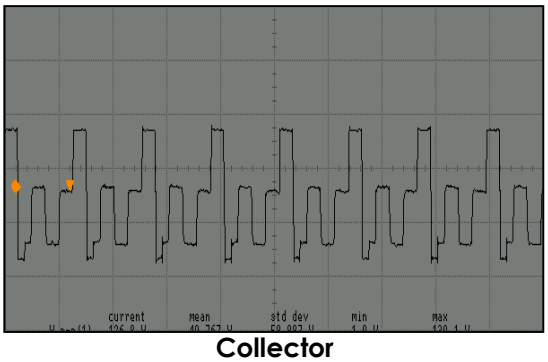
2 V/div, 20 usn/div, Vpp=10V, 15625 Hz



Collector

200 V/div, 20 usn/div, Vpp=932V, 15625 Hz

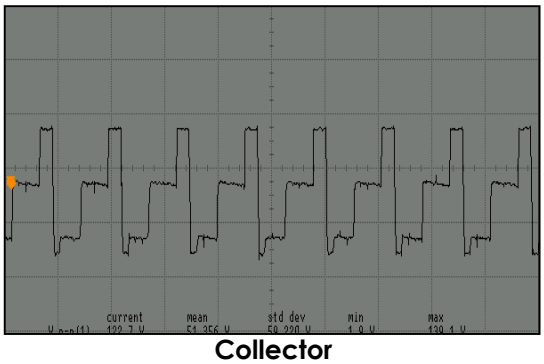
T701



Collector

50V/div, 50 usn/div, Vpp=126.8 V, 15625 Hz

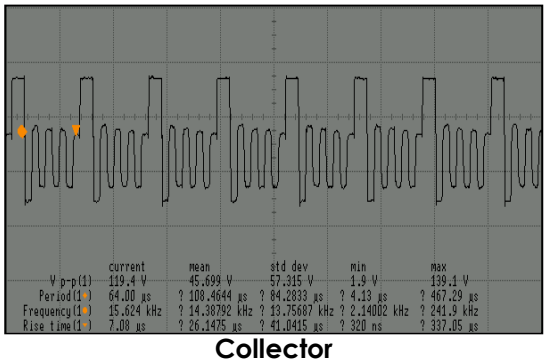
T703



Collector

50V/div, 50 usn/div, Vpp=122.7 V, 15625 Hz

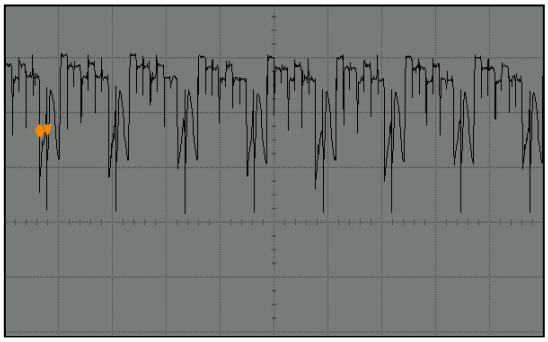
T705



Collector

50V/div, 50 usn/div, Vpp=119.4 V, 15625 Hz

T706



Collector

2V/div, 50 usn/div, Vpp=5.8 V, 15625 Hz

1. ELECTRICAL ADJUSTMENTS

1.1 Supply Voltage Adjustment

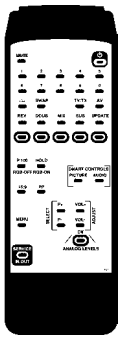
Connect a digital voltmeter to the cathode of diode D607 at the AV mode of the TV and set the screen voltage to the minimum with the screen potentiometer. Adjust the main supply voltage (B+) with P607 potentiometer to the following value (after supply adjustment, readjust Screen and focus voltage).

14" : 105 VDC (for A33EKC01X01)
20" : 118 VDC (for A48EJW011X21)
21" : 110 VDC (for A51EFS83X191)

2. SERVICE ADJUSTMENTS

To enter the Service Mode, 'Service In/Out" button on the Service Remote Control or activate the "Picture Menu" with the user remote control and press "9301" (Press "0" button to exit the Service Mode).

"Red" , "Green", "Yellow" and "Blue" Teletext buttons are for Feature Setup, Geometry, White Balance and IF menus respectively.



2.1 IF Adjustments

2.1.1 PAL SECAM BG/DK/I

- Disconnect IF1 and IF2 terminals on the main chassis.
- Apply a 38.9 MHz PAL colour bar RF signal to the pin 1 of F101 with a pattern generator.
- Switch on the Service Menu with the Service RC and press "Blue" teletext button.
- Check that value of "PVC38" is "07". Adjust the coil LC101 until the the "OK" is seen.
- Press "OK" button on the Service RC.
- Exit from the service menu with the Service RC.
- Reconnect IF1 and IF2 terminals on the main chassis.

Note: "PVF38" is for fine tuning. However, it is automatically applied when "OK" button is pressed at "PVC38" item. Thus any manual adjustment is not required.

2.1.2 SECAM L/L'

- They would not to be adjusted . "PVC33" and "PVF33" were reserved for Secam LL'.

2.2 AGC Adjustment

- Apply a signal with amplitude 65±1 dBuV to the antenna input of TV with a pattern generator (switch sound carrier to Off and switch "Video Ext" to On).
- Switch on the Service Menu with the Service RC and press "Red" teletext button.
- Find the "AGC" with P+ / P- buttons.
- Measure the amplitude of 38.9 MHz sinusoidal signal on pin 11 (IF2) of Tuner with an oscilloscope.
- Change "AGC" to get 640 ± 20 mVpp.
- Add 5 to "AGC" value and change "2.AGC" to this value.
- Exit from the service menu with the Service RC.

2.3 Screen Adjustment

- Switch on the Service Menu with the Service RC and press "Yellow" teletext button.
- Find item "SCRN" in the menu. Apply color bar pattern
- For 14" sets: Adjust the Screen potentiometre until the voltage across the pin of R727 (that is connected CRT cathode) and ground is 139±3 VDC.
- For 20"-21" sets: Adjust the Screen potentiometre until the voltage across the pin of R727 (that is connected CRT cathode) and ground is 164±3 VDC (For 20"Ekranas CPT, adjustment value is154±3 VDC)
- Exit from the service menu with the Service RC.

2.4 White Balance Adjustment

- Apply a white pattern with a pattern generator to the antenna input.
- Enter the Service Menu with the Service RC and and press "Yellow" teletext button.
- Select "B.DRV" option with P+ / P- buttons and change its value to "32" with V+ / V- button.
- Adjust "R.DRV" and "G.DRV" for white balance.
- Adjust "R.CUT" and "G. CUT" for red and green cut off (There is no blue cut off adjustment).
- If white balance can not be adjusted properly change "B.DRV" value.
- Exit from Service menu.

2.5 Geometry Adjustments

- Apply the cross hatch pattern with a pattern generator to the antenna input.
- Enter Service Menu with Service RC and press "Green" teletext button.
- Adjust Vertical Amplitude with "V.4:3" option.
- Add 18 to ""V.4:3" value and change "V.16:9" to this value.
- Adjust vertical position with "V.POS", vertical linearity with "LNRTY", horizontal position with "H.POS".
- Substract 14 from "V.4:3" value and change "V1. 60" to this value.
- Add 4 to "V.4:3" value and change "V2. 60" to this value.
- Set "VP.60" to the same value of "V.POS".
- Set "LN.60" to the same value of"LNRTY" .
- OSD window position can be centered on the screen with "OSD.H" and "OSD.V".
- Exit from the Service Menu.

Note that: There is no horizontal width adjustment in this chassis. It can be adjusted by changing power supply voltage in the interval of -1 and +1 V.

2.6 Feature Setup

Enter the Service Menu with the Service RC and and press "Red" and "Blue" teletext button. Check that below features match with the set.

TUNER	: Phillips, Sharp&Alps, Panasonic, Temic
ST.BY	: YES (Default, Automatic switch off is active), NO (can be used during repair)
AV2	: YES (Front AV is available), NO
CLR.S	: PAL, PAL/NTSC3.5 (+NTSC Playback), PAL/SECAM, PAL/SECAM/NTSC3.5 (NTSC Pback)
SND.S	: BG, I, BG+DK, BG+LL'
QSS/I	: INTERCARRIER, QSS
TEXT	: NON TEXT, DEFAULT (Teletext), FASTTEXT
LANG	: A (West Europe), B (East Europe)
HOTEL	: NORMAL TV, HOTEL TV
RGBIN	: YES (When Scart RGB exists, aerial isn't showed–for only for some Hotel TVs), NO (Default)
APR	: ON (Auto RGB level control is available) , OFF
B.STR	: ON (Black level control is available), OFF
ATS	: YES (Automatic tuning system is on), NO
AVL	: YES (Automatic Volume Limiter is on), NO
ZPG	: YES (Timer Programmed channel switching function is on), NO
ZAPP	: YES (One button channel switching function is on), NO

2.7 Hotel Mode

If "Hotel" option in the Service Menu is selected as "HOTEL TV", the setup menu is get by entering "4658" in the "Features Menu". The setup menu includes the following items:

1. HOTEL MODE : On/off selection and end of TV channels (start is "00")
2. RADIO MODE : On/off selection and start of Radio channels (end is "99").
3. MAX VOLUME : Maximum allowed volume level
4. RESET ADJ. : Sound and picture preset values that will be applied after reset operation
5. MESSAGE : Welcome Message can be edited (max. 148 character long)
6. INFO SCREEN : Information Message can be edited (3 pages, each 500 character long) Customer gets these pages by pressing "INFO" button of Remote Control
7. LOAD DATA : Not operational
8. SAVE DATA : Not operational

2.8 Factory Settings for Service Mode

Values given in Table 1 are typical values and can vary according to the CRT type.

		14"	20"	21"
AGC	Automatic Gain Control 1	32	32	32
2.AGC	Automatic Gain Control 2	AGC + 5	AGC + 5	AGC + 5
ST.BY	Standby	YES	YES	YES
PVC38	VOC Coarse (BG/I/DK)	07	07	07
PVF38	VCO Fine (BG/I/DK)	68	62	62
PVC33	VOC Coarse (LL')	07	13	13
PVF33	VCO Fine (LL')	64	64	64
APR	Auto RGB level control	ON	ON	ON
B.STR	Black level control	OFF	OFF	OFF
QSS/I	QSS/Intercarrier	INTERCARRIER	INTERCARRIER	INTERCARRIER
G.DRV	Green level	32	32	32
R.DRV	Red level	40	40	32
B.DRV	Blue level	37	37	32
R.CUT	Black level offset red	36	36	32
G.CUT	Black level offset green	32	32	32
SCRN	Screen (used for screen adj.)	0	0	0
HPOS	Horizontal shift	30	32	32
VPOS	Vertical shift	12	11	07
V.4:3	Vertical amplitude 4/3 PAL/SEC	23	32	36
V.16:9	Vertical amplitude 16/9 PAL/SEC	V.4:3 + 18	V.4:3 + 18	V.4:3 + 18
LNRTY	Vertical linearity	51	13	49
VP.60	Vertical amplitude NTSC	12	11	07
V1.60	Vertical amplitude 4/3 NTSC	V.4:3 - 14	V.4:3 – 14	V.4:3 – 14
V2.60	Vertical amplitude 16/9 NTSC	V.4:3 + 4	V.4:3 + 4	V.4:3 + 4
LN.60	Linearity NTSC	51	13	49
OSD.H	OSD Horizontal Shift	31	31	29
OSD.V	OSD Vertical Shift	39	39	38

Table 1

2.8 Exit from Service Menu

During exit from service menu, the software version and feature options (hexadecimal number) are shown on the screen.
For example: **SC1.120-01 66F3 T03030702**

CHANNEL FRQENCY TABLE (BG,I,DK,LL')

CHANNEL NO	BG	I	DK	L/L'			
CH1		49.75	49.75	47.75			
CH2	48.25	59.25	59.25	55.75			
CH3	55.25	77.25	77.25	60.50			
CH4	62.25	85.25	85.25	63.75			
CH5	175.25	93.25	93.25	176.00			
CH6	182.25	175.25	175.25	184.00			
CH7	189.25	183.25	183.25	192.00			
CH8	196.25	191.25	191.25	200.00			
CH9	203.25	199.25	199.25	208.00			
CH10	210.25	207.25	207.25	216.00			
CH11	217.25	215.25	215.25	189.25			
CH12	224.25	223.25	223.25	182.25			
CH13	53.75	45.75		196.25			
CH14	62.25	53.75		210.25			
CH15	82.25	61.75					
CH16	175.25	69.75					
CH17	183.25	95.25					
CH18	192.25						
CH19	201.25						
CH20	210.25						
CH21	471.25	471.25	471.25	471.25			
CH22	479.25	479.25	479.25	479.25			
CH23	487.25	487.25	487.25	487.25			
CH24	495.25	495.25	495.25	495.25			
CH25	503.25	503.25	503.25	503.25			
CH26	511.25	511.25	511.25	511.25			
CH27	519.25	519.25	519.25	519.25			
CH28	527.25	527.25	527.25	527.25			
CH29	535.25	535.25	535.25	535.25			
CH30	543.25	543.25	543.25	543.25			
CH31	551.25	551.25	551.25	551.25			
CH32	559.25	559.25	559.25	559.25			
CH33	567.25	567.25	567.25	567.25			
CH34	575.25	575.25	575.25	575.25			
CH35	583.25	583.25	583.25	583.25			
CH36	591.25	591.25	591.25	591.25			
CH37	599.25	599.25	599.25	599.25			
CH38	607.25	607.25	607.25	607.25			
CH39	615.25	615.25	615.25	615.25			
CH40	623.25	623.25	623.25	623.25			
CH41	631.25	631.25	631.25	631.25			
CH42	639.25	639.25	639.25	639.25			
CH43	647.25	647.25	647.25	647.25			
CH44	655.25	655.25	655.25	655.25			
CH45	663.25	663.25	663.25	663.25			
CH46	671.25	671.25	671.25	671.25			
CH47	679.25	679.25	679.25	679.25			
CH48	687.25	687.25	687.25	687.25			
CH49	695.25	695.25	695.25	695.25			
CH50	703.25	703.25	703.25	703.25			
CH51	711.25	711.25	711.25	711.25			
CH52	719.25	719.25	719.25	719.25			
CH53	727.25	727.25	727.25	727.25			
CH54	735.25	735.25	735.25	735.25			
CH55	743.25	743.25	743.25	743.25			
CH56	751.25	751.25	751.25	751.25			
CH57	759.25	759.25	759.25	759.25			
CH58	767.25	767.25	767.25	767.25			
CH59	775.25	775.25	775.25	775.25			

CH60	783.25	783.25	783.25	783.25			
CH61	791.25	791.25	791.25	791.25			
CH62	799.25	799.25	799.25	799.25			
CH63	807.25	807.25	807.25	807.25			
CH64	815.25	815.25	815.25	815.25			
CH65	823.25	823.25	823.25	823.25			
CH66	831.25	831.25	831.25	831.25			
CH67	839.25	839.25	839.25	839.25			
CH68	847.25	847.25	847.25	847.25			
CH69	855.25	855.25	855.25	855.25			
CH70				863.25			
CH71							
CH72							
CH73							
CH74	69.25						
CH75	76.25						
CH76	83.25						
CH77	90.25						
CH78	97.25						
CH79	59.25						
CH80	93.25						
S1	105.25	103.25	103.25	116.75			
S2	112.25	111.25	111.25	128.75			
S3	119.25	119.25	119.25	140.75			
S4	126.25	127.25	127.25	152.75			
S5	133.25	135.25	135.25	164.75			
S6	140.25	143.25	143.25	176.75			
S7	147.25	151.25	151.25	188.75			
S8	154.25	159.25	159.25	200.75			
S9	161.25	167.25	167.25	212.75			
S10	168.25	231.25	231.25	224.75			
S11	231.25	239.25	239.25	236.75			
S12	238.25	247.25	247.25	248.75			
S13	245.25	255.25	255.25	260.75			
S14	252.25	263.25	263.25	272.75			
S15	259.25	271.25	271.25	284.75			
S16	266.25	279.25	279.25	296.75			
S17	273.25	287.25	287.25	55.75			
S18	280.25	295.25	295.25	60.50			
S19	287.25	303.25	303.25	63.75			
S20	294.25						
S21	303.25			303.25			
S22	311.25	311.25	311.25	311.25			
S23	319.25	319.25	319.25	319.25			
S24	327.25	327.25	327.25	327.25			
S25	335.25	335.25	335.25	335.25			
S26	343.25	343.25	343.25	343.25			
S27	351.25	351.25	351.25	351.25			
S28	359.25	359.25	359.25	359.25			
S29	367.25	367.25	367.25	367.25			
S30	375.25	375.25	375.25	375.25			
S31	383.25	383.25	383.25	383.25			
S32	391.25	391.25	391.25	391.25			
S33	399.25	399.25	399.25	399.25			
S34	407.25	407.25	407.25	407.25			
S35	415.25	415.25	415.25	415.25			
S36	423.25	423.25	423.25	423.25			
S37	431.25	431.25	431.25	431.25			
S38	439.25	439.25	439.25	439.25			
S39	447.25	447.25	447.25	447.25			
S40	455.25	455.25	455.25	455.25			
S41	463.25	463.25	463.25	463.25			

SPARE PARTS LIST

PART NO	DESCRIPTION	NOTES	POSITION NUMBERS
273471	C-PEM 47NF K 63V R:5		C0001 C0002
274231	C-PPM 220NF J 250V R:15		C0001 C0002
274230	C-PEM 220NF J 100V R:5		C0002
201222	CC 220PF K 50V NPO R:5		C0003 C0004
250111	EC 1UF 16V 11*5 R:5		C101 C102 C138
251107	EC 10UF M 16V 11*5 R:5		C105
294331	CC-CHIP 330NF K 16V /0805 X		C109
251115	EC 10UF 25V 11*5 R:5		C112 C127 C140
251478	EC 47UF 16V 11*5 R:5		C113 C134
251221	C-ELA 22UF M 50V 11*5 R:5		C126 C131
292475	CC-CHIP 4.7NF K 50V /0603 X		C128 C129
250227	EC 2.2UF 16V 11*5 R:5		C130
252112	EC 100UF 16V 11*6 R:5		C135
250111	EC 1UF 16V 11*5 R:5		C138
291104	CC-CHIP 100PF J 50V /0603 N		C181 C182 C183
292114	CC-CHIP 1NF K 50V /0603 X7R		C201 C202
291226	CC-CHIP 220PF J 50V /0603		C203 C205
291476	CC-CHIP 470PF J 50V /0603 N		C204 C206
293113	CC-CHIP 10NF K 50V /0603		C208
251107	EC 10UF M 16V 11*5 R:5		C301
293113	CC-CHIP 10NF K 50V /0603 X7R		C303
292228	CC-CHIP 2.2NF K 50V/0603 X7R		C304
294118	CC-CHIP 100NF K 16V /0603 X7R		C306 C307
252482	EC 470UF 16V 12.5*10 R:5		C308
251478	EC 47UF 16V 11*5 R:5		C402 C405 C407 C430
251115	EC 10UF 25V 11*5 R:5		C406
291104	CC-CHIP 100PF J 50V /0603 N		C416 C428 C436 C437
250227	EC 2.2UF 16V 11*5 R:5		C419
251115	EC 10UF 25V 11*5 R:5		C426
291104	CC-CHIP 100PF J 50V /0603 N		C428 C436 C437
274227	C-PEM 220NF J 50V R:5		C501
253106	EC 1000UF 25V 20*13 R:5		C503
250111	EC 1UF 16V 11*5 R:5		C505 C511 C512
251115	EC 10UF 25V 11*5 R:5		C506
293155	CC-CHIP 15NF K 50V /0603 X7R		C508
273333	C-PEM 33NF K 100V R:5		C508A
291476	CC-CHIP 470PF J 50V /0603 N		C509
252105	EC 100UF 50V 12*8 R:5		C510
294109	CC-CHIP 100NF K 50V /0805 X		C513
251484	C-ELA 47UF 35V 11*6.3 R:5		C553
271390	C-PPM 390NF J 250V R:15 CLA		C554
272688	C-PPM 6.8NF %3.5 1.5/1.6KV		C555
239490	C-ELA 4.7UF 160V 11*6.3 R:5		C556
252481	C-ELA 470UF 50V 20*10 R:5		C557
293478	CC-CHIP 47NF K 25V /0603 X7R		C558
251109	EC 10UF 250V 16*10 R:5		C560
274102	C-PEM 100NF J 63V R:5		C562
274107	C-PEM 100NF J 100V R:5		C563
252482	EC 470UF 16V 12.5*10 R:5		C564
221571	C-CE 560PF 500V TAPE R:5		C566
274340	C-PEM 330NF K 275V-AC R:22.		C601
274103	C-PEM 100NF K 275V-AC R:15		C602
202105	CC 1NF K 1KV Y5P R:5		C603 C604
251681	C-ELA 68UF 400V 25*22 R:10		C605
203330	C-PPM 33NF J 630V R:15		C606
273222	C-PEM 22NF K 250V R:7.5		C607
201471	CC 470PF 2KV		C608
292228	CC-CHIP 2.2NF K 50V/0603		C609
293113	CC-CHIP 10NF K 50V /0603 X7R		C610 C620 C621

SPARE PARTS LIST

251221	C-ELA 22UF M 50V 11*5 R:5		C611
291561	CC-CHIP 560PF J 50V /0603 NPO		C612
290562	CC-CHIP 56PF J 50V/0603 NPO		C613
250115	C-ELA 1UF 50V 11*5 R:5		C615
202220	CC 2.2NF M 250VAC Y5U R:10		C616
201226	CC 220PF K 2KV Y5P R:5		C617
251489	C-ELA 47UF 160V 21*13 R:5		C618
251337	C-ELA 33UF 160V 21*10 R:5		C619
293478	CC-CHIP 47NF K 25V /0603		C622 C625 C626
252111	C-ELA 100UF 10V 11*5 R:5		C623
253106	EC 1000UF 25V 20*13 R:5		C624
252223	C-ELA 220UF 16V 11*8 105 R:5		C627
293478	CC-CHIP 47NF K 25V /0603		C628 C629 C630
252127	C-ELA 100UF 10V 11*5 105 R:5		C632
251225	EC 22UF 16V 11*5 R:5		C634
250228	C-ELA 2.2UF 250V 11*8 R:5		C702
291476	CC-CHIP 470PF J 50V /0603 N		C703 C707 C710
201476	C-CE 470PF K 1KV R:5		C705 C708 C711
202221	C-CE 2.2NF K 2KV Y5P R:7.5		C712
274105	C-PEM 100NF J 250V R:10		C713
291101	CC-CHIP 100PF J 50V /1206 N		C981 C982
302289	DIODE 1N4148 52MM		D105
302289	DIODE 1N4148 52MM		D105 D106
302289	DIODE 1N4148 52MM		D107 D110
303850	LED LTL 4263 RED L=25.4		D401
302289	DIODE 1N4148 52MM		D402 D403
303308	DIODE RF2007		D502
302289	DIODE 1N4148 52MM		D503 D557 D558
300305	DIODE BA157		D552 D556 D560
303227	DIODE RGP15J ⚠		D553
300305	DIODE BA157		D556 D560
303308	DIODE RF2007		D601 D602 D603 D604
303217	DIODE RGP10J		D605
302289	DIODE 1N4148 52MM		D606
303206	DIODE RGP30MS		D607
303813	DIODE RGP15D		D608
302948	DIODE 1N4007		D701
303195	DIODE 4148 MELF		D702 D703 D704
303993	LED LTL4221N D:3 R/D RED		D980
303991	LED IR SIR563SB3F 23/940		D981
056070	SAW FILTRE OFW K2966M	DK	F101
056746	SAW FILTER OFW G1968M	BG	F101
056760	SAW FILTRE OFW J1956M	I	F101
056734	SER.FILTER TPSRA5M50B00-A0		F103
056734	SER.FILTER TPSRA5M50B00-A0	BG	F103
056739	SER.FILTRE TPSA6M00B00-A0	I	F103
056762	SER.FILTRE TPT02B	DK	F103
054261	FUSE 2.5AT (215 SER.) ⚠		F601
452990	IC STV2249C	PAL SECAM	IC101
452842-01	IC STV2246C	PAL BG	IC101
452439	IC TDA2822		IC301
MC1120-02	IC SDA5535 A056		IC401
452662	IC-CHIP AT24C16N SC2.7	HOTEL TV	IC402
453031-01	IC-CHIP AT24C08N-10SI-2.7 (	NON HOTEL TV	IC402
452521	IR RECEIVER TSOP 1838		IC403
452648	IC TDA8174AW		IC501
452795	IC TDA16846		IC601

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451518	IC KA317TU T0220CASE		IC602
50S310	INSULATER BUZ90 17*12*.15		IC602
451517	IC TDB7805CT T0220CASE		IC603
452382	IC-CHIP S3C1840DA9/SMB1		IC980
055139	CHOKE COIL 50MHZ 600R PH-WB		L0001 L0002
053711	COIL 10UH K (TAIYO) LAL03		L0003
053711	COIL 10UH K (TAIYO) LAL03		L101 L102
053724	COIL-CHIP 6.8UH K/0805		L103
053805	COIL-CHIP 1UH K /0805		L104
179005	RC-CHIP 0R /0603 1.6*0.8		L109
053711	COIL 10UH K (TAIYO) LAL03		L401 L402
053805	COIL-CHIP 1UH K /0805	DK	L404
053749	COIL 18UH K /3.4 26MM		L405
051585-SN	COIL H-LIN 70UH		L551
053781	COIL 2.2UH LAL04 ⚠		L552
051687-SN	LINE FILTER 27MH E-TYPE ⚠		L601
053778	COIL 47UH J LAL03		L602
053739-SN	COIL CHOKE 50UH		L603
053506-01	COIL DEMOD 38.9 HEX		LC101
132209	R-VAR 2.2K (V) 5*3		P601
132500	R-VAR 5K (V) 5*3		P601
056023	CRYSTAL 4.433619MHZ (NO LOA		Q101
056660	CRYSTAL 3.579545 90OHM BULK	NTSC	Q102
056620	CRYSTAL 6MHZ (CL 30PF)		Q401
056210	CER.RESONATOR GSB455E		Q980
101221	CFR 220R J 1/2W 52MM		R0001 R0003
102141	CFR 1K J 1/4W /6 26MM		R0002 R0004
101471	CFR 470R J 1/2W /9 52MM		R0005
173277	RC-CHIP 27K J 1/16W /0603 T		R101 R417
172224	RC-CHIP 2.2K J 1/16W/0603 T		R132 R133 R156
173108	RC-CHIP 10K J 1/16W /0603		R139
173153	RC-CHIP 15K J 1/16W /0603 T		R201 R211 R213
172393	RC-CHIP 3.9K J 1/16W/0603 T		R202
170750	RC-CHIP 75R J 1/10W /0805		R203 R204 R205 R206 R217
171562	RC-CHIP 560R J 1/16W/0603 T		R207 R208
171107	RC-CHIP 100R J 1/16W /0603		R209 R214
172104	RC-CHIP 1K J 1/16W /0603		R210 R212
173153	RC-CHIP 15K J 1/16W /0603 T		R211 R213
100752	RC 75R J 1/4W /6 52MM		R215
172224	RC-CHIP 2.2K J 1/16W/0603 T		R216
179001	RC-CHIP 0R /0805 2*1.25		R218
173153	RC-CHIP 15K J 1/16W /0603 T		R302
173685	RC-CHIP 68K J 1/16W /0603		R303
172824	RC-CHIP 8.2K J 1/16W /0603		R304
173108	RC-CHIP 10K J 1/16W /0603		R305
179475	RC-CHIP 4.7R J 1/16W/0603		R306 R307
119331	RMF 3.3R J 1W		R309
119485	RMF 4.7R J 1.5W		R309
172182	RC-CHIP 1.8K J 1/16W /0603		R310
172336	RC-CHIP 3.3K J 1/16W /0603		R401 R434 R446
103116	CFR 10K J 1/4W /6 52MM		R404
102487	RC 4.7K J 1/4W /6 26MM		R412
173108	RC-CHIP 10K J 1/16W /0603		R414 R418
173277	RC-CHIP 27K J 1/16W /0603 T		R417
103136	CFR 10K J 1/4W /6 26MM		R419
102101	RC 1K J 1/4W /6 52MM		R422

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102141	CFR 1K J 1/4W /6 26MM		R423
171107	RC-CHIP 100R J 1/16W /0603		R431 R469
101494	RC 470R J 1/4W /6 26MM		R432
172336	RC-CHIP 3.3K J 1/16W /0603		R434 R446
142272	RC 2.7K J 1/4W /3.2 26MM		R436
053816	RC 220R J 1/4W 26MM		R441 R442
171224	RC-CHIP 220R J 1/16W/0603 T		R450 R451 R452
172224	RC-CHIP 2.2K J 1/16W/0603 T		R454
179001	RC-CHIP 0R /0805 2*1.25		R481 R185
119227-01	RMF 2.2R J 1W		R501
101471	CFR 470R J 1/2W /9 52MM ⚠		R502 R567
100220	CFR 22R J 1/2W 52MM		R503
172104	RC-CHIP 1K J 1/16W /0603		R504 R551
174152	RC-CHIP 150K J 1/16W /0603		R505 R506
172182	RC-CHIP 1.8K J 1/16W /0603		R508 R512
119153	RM 1.5R J 1/2W 52MM		R509
172276	RC-CHIP 2.7K J 1/16W /0603		R511
173108	RC-CHIP 10K J 1/16W /0603		R513 R562 R565
172165	RC-CHIP 1.6K %1 1/16W /0603		R516
173822	RC-CHIP 82K J 1/16W/0603 TA		R518
102101	RC 1K J 1/4W /6 52MM		R519
173114	RC-CHIP 100K J 1/16W /0603		R521
173563	RC-CHIP 56K J 1/16W /0603		R522 R523
172393	RC-CHIP 3.9K J 1/16W/0603 T		R524
113225	RM 22K J 1/2W 52MM		R526
170472	RC-CHIP 47R J 1/10W /0805		R555
101343	RC 330R J 1/4W /6 26MM		R557
119337	RMO 3.3R J 2W R:27.5 TAPE		R559
119684	RMF 0.68R J 1W		R560
171562	RC-CHIP 560R J 1/16W/0603 T		R564
110823	RMO 82R J 3W R:20		R566
102141	CFR 1K J 1/4W /6 26MM		R568
113225	RM 22K J 1/2W 52MM		R569
100271	RC 27R J 1/2W/9 52MM		R570
119331	RMF 3.3R J 1W		R571
129272	RW 2.7R K 5W R:10		R601
113683	RMO 68K J 1.5W 73MM		R603
154234	PTC 9R/2 PIN - 3CYCLE		R604
100220	CFR 22R J 1/2W 52MM		R605
115103	RM 1M J 1W 52MM		R606
173332	RC-CHIP 33K J 1/16W /0603		R607
115391	RM 3.9M J 1W 52MM		R608
173277	RC-CHIP 27K J 1/16W /0603 T		R611
103155	RC 15K J 1/4W 52MM		R612
115470	RM 4.7M J 1/2W 52MM ⚠		R613
113393	RM 39K J .5W 52MM		R614
119109	RNF 0.1R J 0.4W (UFLB) 52MM ⚠		R615
171241	RC-CHIP 240R %1 1/16W /0603		R616 R621
172131	RC-CHIP 1.3K %1 1/16W/0603		R617
171392	RC-CHIP 390R %1 1/16W/0603		R622
114470	RM 470K J 1/2W 52MM		R623
171824	RC-CHIP 820R J 1/16W /0603		R624
172336	RC-CHIP 3.3K J 1/16W /0603		R625
171224	RC-CHIP 220R J 1/16W/0603 T		R704 R702 R703
104103	RC 100K J 1/2W 52MM		R708
141222	RC 220R J 1/4W /3.2 26MM		R709
113153	RMO 15K J 1W R:15		R710 R715 R720
142272	RC 2.7K J 1/4W /3.2 26MM		R713 R718
102159	CFR 1.5K J 1/2W /9 52MM		R725 R726 R727
104103	CFR 100K J 1/2W 52MM		R728

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179002	RC-CHIP 0R /1206		R981
031244	SCART SOCKET 12.6/12.7		SK201
010860	TACT SW LONG STEN		SW401 SW402 SW403
010861	ON/OFF SWITCH BK98		SW601
401141	TRN-CHIP BC848B SOT23		T101 T102 T107
401141	TRN-CHIP BC848B SOT23		T201 T202
401141	TRN-CHIP BC848B SOT23		T301 T302
401142	TRN-CHIP BC858B SOT23		T401
401141	TRN-CHIP BC848B SOT23		T501 T502
401332	TRN BU808DFI		T504
401334	TRN STX112		T551
401219	TRN STP3NB60FP		T601
401141	TRN-CHIP BC848B SOT23		T602
401397	TRN 2SC 2482		T701 T703 T705
401142	TRN-CHIP BC858B SOT23		T980
058019	FBT-SANAL 20/21" 12.6 ⚠	20"/21"	TR501
058419	FBT-SANAL 14" 12.8 ⚠	14"	TR501
059013	SMPS-SANAL 20/21" 12.1 ⚠	20"/21"	TR601
059413	SMPS-SANAL 14" 12.1 ⚠	14"	TR601
G99136-PH2	TUNER PH ASM.PLL UV1316/AIG-3		TU101
031165	KONN. CINCH ..... YEL		X0002
031176	CONN.CINCH 12.1 FRONT-AV YE		X0002
031163	KONN. CINCH ..... WHITE		X0003
031166	CONN.CINCH 12.1 FRONT-AV WH		X0003
031180	CONN.HEADPHONE 12.1 FRONT-A		X0004
031791	EARPHONE JACK		X0005
031860	CONN.HOUSING X2004 BLACK		X201
031856	CONN.HOUSING X2003 BLACK		X301
031850	CONN.HOUSING 2'LI GREY		X501
031777	CON.HOUSING LOCKED 5/4		X502
031793	CON.HOUSING 2P MALE TPK75(P		X601 X602
031530-02	INCHANG/CRT SOCKET ISHM23S-		X703
031532	CRT SOCKET NARROW INCHANG		X703
302786	DIODE Z. MTZJ6.2B 52MM		ZD101
302294	DIODE Z. C8V2 26MM		ZD102
303771	DIODE Z. UZT33V		ZD601
010861	ON/OFF SWITCH BK98		
031163	KONN. CINCH ..... WHITE		
031165	KONN. CINCH ..... YEL		
031777	CON.HOUSING LOCKED 5/4		
031791	EARPHONE JACK		
031850	CONN.HOUSING 2 PIN GREY		
031856	CONN.HOUSING X2003 BLACK		
031860	CONN.HOUSING X2004 BLACK		
056314-EK3	CPT EK A33EKC01X01		
056320-VC1	CPT VC A48EJW011X21		
056321-GS8	CPT GS A51QAE320X67(P)		
5FZ107-AS	SPEAKER 8R 3W(N)/5W(M) 50X9		
614167-AS	DEGAUSSING COIL ASSY 14" BA ⚠		
620167-AS	DEGAUSSING COIL ASSY 20" BA ⚠		
621167-AS	DEGAUSSING COIL ASSY 21" BA ⚠		
6BZ107-AS	SPEAKER 16R 3W(N)/5W(M) 50X		

Please note that Product Part List Files should be investigated for the mechanical parts like cabinets, etc.

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